

**SUMMER EXAMINATIONS 2000**

**HIGHER DIPLOMA IN APPLIED SCIENCE  
(MICROBIOLOGY)**

**PAPER 2**

**EXTERN EXAMINER:            PROFESSOR C M BROWN**  
**INTERNAL EXAMINER :       Internal Examiners**

**TIME ALLOWED : 3 HOURS**

**(INDICATE CLEARLY THE QUESTIONS ANSWERED ON THE  
FIRST PAGE OF YOUR ANSWER BOOK)**

**ANSWER FIVE QUESTIONS**

- Q.1    Quality costs are an essential component of any quality control system and can be generally divided into costs associated with production, appraisal, internal and external failure. Discuss
- Q.2    Write an essay on larger manufacture using the conventional batch process.
- Q.3    With the aid of a flow diagram, describe how lactic butter is manufactured. What micro-organisms are associated with the spoilage of butter?
- Q.4.   (i)    Discuss the environmental factors that affect *in situ* bacterial bioremediation of contaminated sites.
- (ii)    Compare and contrast *in situ* and *ex-situ* methods for bacterial remediation of contaminated soils.
- Q.5.   Describe the microbiology of anaerobic digestion and how this process is used for the treatment of industrial wastewaters.
- Q.6.   Write an essay on your understanding of Environmental Management Systems (ISO 14001). Briefly, outline how this relates to the ISO 9000 series.
- Q.7.   Define the role of robustness in generating an SOP.
- Q.8.   Answer either (a) or (b).
- (a)    Discuss Compliance criteria.
- (b)    Write short notes on the Following:
- (i)    Accuracy.
- (ii)    Precision.
- (iii)    External Validation.
- Q.9.   Write an essay on 'Using HACCP to attain Safe Foods'.